



INSTITUT C.D. HOWE INSTITUTE

COMMENTARY

NO. 406

Ottawa's Hidden Deficit: The Widening Gap between Federal Government Pension Liabilities and Assets

The fair-value unfunded liability of federal employees' pension plans stood at \$272 billion at the end of the 2013 fiscal year – some \$120 billion higher than reported. At fair value, the annual cost of benefits accruing in these plans is 45-60 percent of pensionable pay – more than twice as high as reported. Incorporating these numbers in Ottawa's financial reports would foster reforms that would alleviate a burden few taxpayers know they bear.

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COMMENTARY No. 406
APRIL 2014
PENSION POLICY



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\$12.00
ISBN 978-0-88806-927-6
ISSN 0824-8001 (print);
ISSN 1703-0765 (online)

THE STUDY IN BRIEF

Defined-benefit (DB) pension plans have been in trouble in recent years, largely because their sponsors have tended to underestimate their liabilities. As Canadians saving for retirement in registered retirement saving plans and defined-contribution pension plans have begun to realize, low yields on low-risk assets require more saving to achieve a given future income. Many DB plan sponsors, however, use inflated assumptions about returns – effectively presuming that risky investments will unfailingly pay off – to obscure the need for higher contributions.

In Canada, the largest DB plans are those for federal government employees. Canadian taxpayers underwrite a promise that assumes a rate of return well in excess of current interest rates on federal government bonds – even on assets that do not exist. Although Ottawa has taken steps to rein in the growing cost of pension plans for public servants, uniformed personnel and MPs – arguably the largest and richest defined-benefit pensions in the country – these plans' unfunded liabilities are massive, much larger than reported, and still growing. The contributions to these plans, even after the most recent reforms, come nowhere close to covering the rocketing cost of their taxpayer-guaranteed promises.

An economically meaningful fair market value estimate of the unfunded liability of federal government employees' pension plans puts it at \$272 billion as at March 31st, 2013 – some \$120 billion higher than reported. The same approach to determining the annual cost of benefits accruing in these plans shows it to be between 45 and 60 percent of pensionable pay – more than twice as high as reported, and a far higher rate of tax-deferred wealth accumulation than is available to other Canadians.

The federal government should incorporate these numbers in the official measures of its net debt and annual budget balance. This would be a key first step toward reforms that would alleviate a burden that few taxpayers know they bear, and that would protect taxpayers from risks few know they run.

C.D. Howe Institute Commentary® is a periodic analysis of, and commentary on, current public policy issues. Barry Norris and James Fleming edited the manuscript; Yang Zhao prepared it for publication. As with all Institute publications, the views expressed here are those of the authors and do not necessarily reflect the opinions of the Institute's members or Board of Directors. Quotation with appropriate credit is permissible.

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Defined-benefit (DB) pension plans in Canada and around the world have been in trouble in recent years. Among the most important reasons for their problems is that sponsors have tended to underestimate their liabilities.¹

People and companies preparing for the future using money-purchase arrangements such as defined-contribution (DC) pension plans and personal saving vehicles get regular reminders that current low yields on high-quality assets force them to save more to achieve a given income in retirement.² Many DB plan sponsors, however, use inflated assumptions about returns.³ They report plan balances that are unrealistically healthy and annual increases in liabilities that are unrealistically small, obscuring the need for more saving – in other words, higher contributions.

As a result, some DB plans have already failed to pay their benefits, and scrutiny of assumptions about returns in these plans has increased. Until

recently, however, the belief that governments will not go bankrupt – or that, if they do, the pensions they have promised their employees will still be paid – has made this scrutiny less intense for public-sector than for private-sector plans. The bankruptcy of Detroit, the most spectacular failure among US cities to date, is a stark counterexample, and a timely reminder that, in both the public and private sectors, only adequate saving can make a pension promise secure.⁴

In this *Commentary*, we document the size of the federal government's unfunded pension obligations and the extent to which official measures of Ottawa's net debt, annual budget balance and program spending understate the burden that few

This *Commentary* updates calculations in Robson (2012), and draws heavily on that report and on Laurin and Robson (2009, 2011, 2012). We thank Don Drummond, several members of the C.D. Howe Institute Pension Policy Council – notably Keith Ambachtsheer, Steve Bonnar, Malcolm Hamilton and Claude Lamoureux – and an anonymous reviewer for their advice. Responsibility for any errors and the conclusions is ours alone.

- 1 Compounding the problem of underestimated liabilities is the maturing of DB plans, in the sense that the number of active employees has shrunk relative to the number of retirees. In mature plans, the contributions needed to eliminate a deficit are a larger share of active employees' pay.
- 2 With real returns of 5 percent, a man who expects to retire at age 65 and wants a dollar of single-life annuity pension (no guarantee period) indexed to 2 percent inflation will need about \$12 in assets. With real returns of 1 percent – roughly what a retail investor buying federal government real-return or nominal bonds would get at the time of writing – he would need \$17 in assets.
- 3 In their last actuarial valuations, Canada's largest public-sector DB pension plans all used real discount rates for funding purposes that were well above government long-term bond yields, assuming a premium ranging from about 2.5 percentage points (for the Ontario Teachers' Pension Plan) to 3.75 percentage points (for the Ontario Municipal Employees Retirement System plan) above the real return bond yield.
- 4 In practice, national governments that control their own central banks, as Canada's federal government controls the Bank of Canada, can force the central bank to buy their debt and thus finance any expenditure, pension payments included, with newly created money. Using the inflation tax in this way to finance pension payments is objectionable on many grounds, and in Canada would – unless undertaken entirely surreptitiously – likely prove politically unacceptable.

taxpayers even know they bear. We then proceed to recommend some changes that would protect taxpayers from risks that few know they run.

THE VALUE OF OTTAWA'S PENSION PROMISES

In Canada, the DB plans with the largest gap between the value of their promises and the assets set aside to cover them are the three pension schemes for federal government employees: the Public Service, the Canadian Forces and the Royal Canadian Mounted Police (RCMP) plans. All federal pension plans were unfunded until 2000. The possibility that Ottawa might not be readily able to come up with the cash to make pension payments – and ought therefore to save and accumulate claims on other entities that would be available when the pensions came due – did not figure in the design of these plans. Although the federal government recorded estimates of its pension obligations in its financial statements, it held no assets against them; the recorded obligation was simply part of the government's debt.

Since 2000, contributions to these plans have been used to purchase assets, so the three plans are now partially funded. Taxpayers, however, still underwrite all the financial risks associated with the plans' benefit promises. In practice, this means that employees are paid, in advance, a generous risk premium on pension investments before investment returns are earned. Any future pension shortfall will be paid through taxes that will be higher than otherwise. Although Ottawa has taken some steps to rein in the growing cost of its pension plans – and has improved its reporting of their status in some useful ways – these plans' unfunded liabilities

are massive – much larger than reported – and still growing.

The Reported Numbers

The Public Accounts for fiscal year 2012/13 (ended March 31, 2013) reported the accumulated obligation of the federal government's DB plans at \$242.7 billion. After allowing for recorded assets of \$72.2 billion and an "unrecognized actuarial loss"⁵ of \$18.9 billion, the balance – an unfunded liability that is part of the net federal debt Canadian taxpayers underwrite – as at the end of the fiscal years was \$151.7 billion (shown in the first column of Table 1). Even scaled to the size of the federal government and the Canadian economy, \$151.7 billion is a big number: one-quarter of Ottawa's reported debt,⁶ and more than \$17,000 per Canadian family of four. Yet even this huge reported number understates the burden Ottawa's pensions create for taxpayers.

The understatement is not on the asset side. In fact, the reported \$72.2 billion is an understated value for the assets, "smoothed" by recognizing gains and losses above a certain threshold only over a number of years. The estimated market value of the plans' assets (shown at the top of the second column of Table 1) was \$76.6 billion. The problem is on the liability side, where Ottawa's accounting badly understates the size of its pension obligations.

Calculating the Fair Value of Federal Pension Liabilities

Because pension payments will occur in the future, expressing them on a balance sheet requires discounting them to their current value. Much

5 This is a smoothing process, which recognizes these losses gradually over time. Giving credit where it is due, we note that the Public Accounts previously labeled this item an "unamortized estimation adjustment." The new term is one of several changes in presentation in recent years that make the federal pension accounting easier to understand.

6 The reported accumulated deficit stood at \$602.4 billion as at March 31, 2013.

Table 1: Balance Sheet of Federal Pension Plans, March 31, 2013

	Public Accounts	Fair Value
	<i>\$ Billions</i>	
Assets ^a	72.2	76.6
Liabilities ^b	242.7	348.2
Unrecognized net actuarial loss	-18.9	
Balance	151.7	271.6

a Includes investments and contributions receivable for past service. As noted in the Public Accounts of Canada (Canada, Receiver General for Canada 2012/13, 2.11):

Investments held by the Public Sector Pension Investment Board...are valued at market related value. The market related value of investments is established on the basis of an expected rate of return on investments. Fluctuations between the market value and expected market value are included in actuarial gains or losses over a five-year period; provided that the market related value of investments remains within a limit of plus or minus 10 percent of the market value. When the market related value exceeds this limit, the excess amount is included immediately in actuarial gains or losses. Contributions receivable from employees for past service buy back elections are discounted to approximate their fair value.

b Fair value estimated using methodology found in text.

Sources: Canada, Receiver General for Canada (2012/13); authors' calculations.

recent thinking about pensions emphasizes the virtue of doing this with "fair-value" calculations that use actual market yields on securities with similar characteristics to the pension payments.⁷ The federal government, however, does not do this. Instead, it uses two notional interest rates. One, a legacy from the period before 2000 when federal pensions were completely unfunded, is a moving average of past and expected nominal yields on 20-year federal bonds – currently 2.6 percent in real (inflation-adjusted) terms. The other is an assumed return on fund assets for benefits earned since 2000 – currently 3.9 percent in real terms.

Both these interest rates are higher than the discount rate that fair-value principles would dictate. Suppose someone not participating in a federal pension plan wanted retirement income similar to that promised a federal employee – or, alternatively, wanted future income that would offset the federal taxes she or he expects to pay to cover those pensions. That person would need a nest-egg of assets with federal-pension-like characteristics – that is, securities backed by taxpayers and indexed to inflation. The securities that best fit that description are the federal government's real return bonds (RRBs). And the

7 The term "fair value" reflects the idea that an asset or liability is worth what a person making an arm's-length transaction, not under duress, would pay for it or give to be relieved of it. It does not presume that market valuations are always correct; it nevertheless takes them as indications of the price at which such transactions are occurring.

yield on RRBs determines the size of the nest-egg this person would need.⁸ At the end of March 2013, that yield stood at 0.5 percent; it now stands at around 1 percent.

Although the Public Accounts do not provide all the necessary information to calculate how much bigger federal pension liabilities would have been if discounted at a real rate of 0.5 percent, we can come up with a conservative figure (see Box 1). In short, the gap between the 2.6 and 3.9 percent real discount rates used in the Public Accounts for the unfunded and funded elements of the plans respectively on one side, and the 0.5 percent yield on the RRB on the other, translates into a pension obligation that is not the \$242.3 billion reported in the first column of Table 1, but the \$348.2 billion in the second column of the table.⁹

The final step toward a fair-value estimate for Ottawa's pension balance sheet is to remove the "unrecognized net actuarial loss." This number, in the first column of Table 1, represents changes in asset values and liability estimates, using the federal government's "smoothing" accounting, not yet reflected in the Public Accounts. The fair-value approach to assets and liabilities does not smooth; rather, it recognizes all such changes immediately, so this figure has no counterpart in the second

column of Table 1. The net result, therefore, is an unfunded pension liability of \$271.6 billion at the end of fiscal year 2012/13 – more than \$31,000 per Canadian family of four, and \$119.9 billion higher than the reported number.

THE GROWTH OF THE UNREPORTED LIABILITY OVER TIME

The gap between the reported and fair-value tallies of Ottawa's unfunded pension liability was small at the beginning of the 2000s, when the difference between the notional interest rates used to discount the obligations in the Public Accounts and the actual RRB yield was small. As the difference between the yields increased, however, the gap between the two numbers grew to its startling size as of the end of fiscal year 2012/13. Figure 1 contrasts the two over the past 12 years, while Table 2 shows the key numbers underlying the calculations for each year.

Because the unfunded pension liability of \$119.9 billion is part of Ottawa's debt, the fair-value adjustment raises the debt by the same amount at the end of fiscal year 2012/13. And because the gap between the reported and fair-value pension liability – and hence between reported and adjusted

8 Using discount rates that reflect the nature of a pension plan's obligations in valuing plan liabilities, rather than assumed returns on plan assets (even when the plan's assets are less than its liabilities or even zero), is still controversial in some quarters, despite its increasing acceptance among pension experts (see, for example, Andonov, Bauer, and Cremers 2013). In the case of Ottawa's pensions, the challenge a non-federal employee would face in obtaining the same retirement income, or hedging against the higher taxes the individual expects to pay to cover federal employee pensions, makes the suitability of the RRB yield as a discount rate clear (Hamilton 2014a). If federal employees who defend the higher discount rate used in the Public Accounts received an offer to buy them out at that rate, any financial advisor worth listening to would advise against it, since the nest-egg they would need to replace the pension would be larger than the offer. We point out, moreover, that this abstract example ignores the costs and tax limits on individual tax-deferred saving that would frustrate the non-federal employee's attempt – a further advantage for federal pension-plan members we do not quantify here (see Pierlot and Siddiqi 2011).

9 The RRB yield on January 31, 2014, was 0.95 percent, up 0.46 percentage points from its end-of-March 2013 value. At the current RRB yield, fiscal year 2012/13 fair-value pension obligations would have been about \$330 billion, instead of \$348 billion.

Box 1: Discount-Rate Sensitivity of Estimates of Federal Pension Plan Obligations

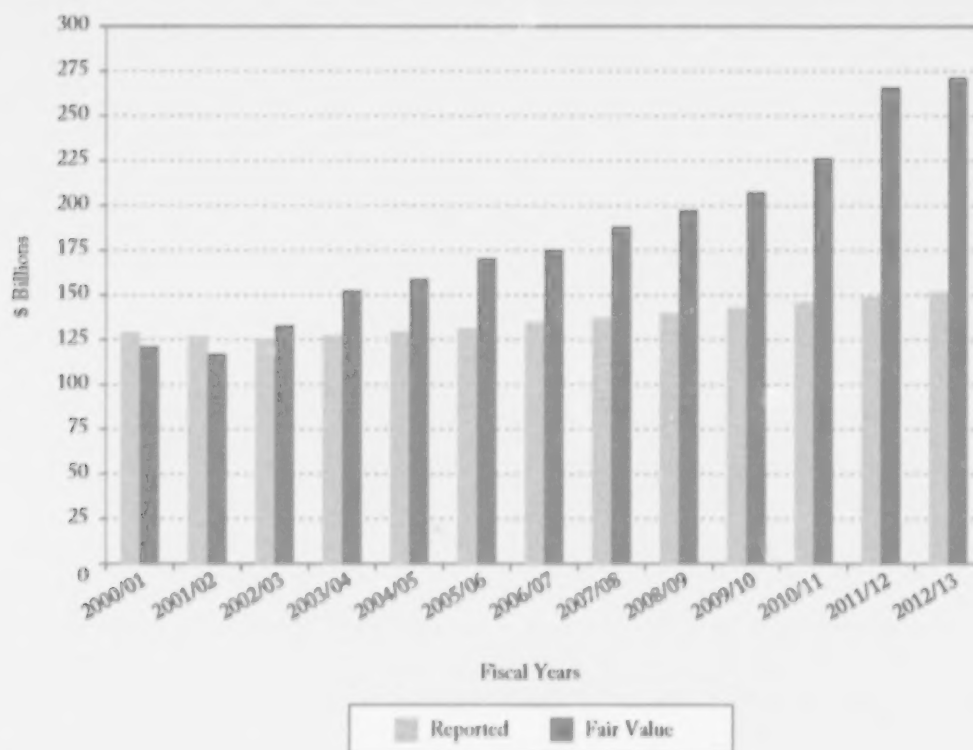
The presentation of federal pension plans in the fiscal year 2012/13 Public Accounts changed in a number of ways relative to previous years. Many of those changes were for the better. In particular, the Public Accounts now separate the “unfunded” obligations – those accrued before the 2000 reforms that established investment funds – from the “funded” obligations accrued after the reforms, and present separate figures, including discount-rate sensitivities, for the two categories. Since the duration of the unfunded obligations, which were earned longer ago, is shorter than that of the funded obligations, getting separate estimates of the sensitivity of the two is better than using a combined figure.

Unfortunately, however, although the sensitivity in the Public Accounts for the funded obligations shows, as in the past, the effect of a one-percentage-point change in the discount rate for those obligations, the sensitivity for the unfunded obligations does not show the effect of a change in the discount rate – which is a 20-year average of bond yields – but only the effect of a change in future bond yields. We therefore refer back to the 2011/12 Public Accounts for an estimate of the sensitivity of the unfunded obligations to a change in the discount rate that year, and use the ratio of that figure to the sensitivity of the funded obligations in 2012/13 to come up with a sensitivity for the unfunded obligations in 2012/13 (see Appendix Table A-1). This method suggests that the effect of a 1 percent lower discount rate on the funded portions of the plans is \$18.1 billion, and the effect of a 1 percent lower discount rate on the (much larger) unfunded portion of the plans is \$20.7 billion.

The actual difference between the discount rates used in the funded and unfunded portions of the plans is 2.1 and 3.4 percentage points, respectively. Multiplying these by the appropriate sensitivities results in the \$105.5 billion upward adjustment in plan liabilities shown in Tables 1 and 2. Because the effect of differences in the discount rate is not linear – the sensitivities in the Public Accounts show that lowering the discount rate on the funded parts of the plans increases their liability by \$18.1 billion but raising it lowers the liability by only \$13.7 billion – this adjustment is very conservative. It more than compensates, however, for any exaggeration in our estimate of the sensitivity of unfunded obligations to a one-percentage-point change in the discount rate, so our total estimate of pension liabilities is lower than would be a fair-value estimate based on more complete information.

Finally, the Public Accounts present estimates labeled as fair values (Canada, Receiver General for Canada 2012/13, 2.35) that show the difference between “carrying value” and “fair value” for various federal assets and liabilities. They include a “fair value” for pension liabilities that is only slightly larger than the official estimate (“carrying value”) because no changes are made to the pension obligation and thus to the discount rate assumed for its actuarial valuation – only pension assets are restated to the actual market value of investments. As shown here, proper discounting with the RRB rate leads to a much higher fair value for the pension obligation. To use fair-value terminology without its substance in this way is regrettable.

Figure 1: Net Federal Pension Obligation, Reported vs Fair-Value Estimate, Fiscal Years 2000/01–2012/13



Sources: Canada, Receiver General for Canada (various years); authors' calculations.

measures of federal debt – has been widening, the fair-value approach yields annual budget balances for the federal government that are much worse than reported (Figure 2). Indeed, the higher-than-reported growth of Ottawa's pension obligations reduced or eliminated the budget surpluses that the government reported from fiscal years 2001/02 to 2007/08, and made the cumulative deficits over the past five fiscal years not the reported \$144.8 billion, but \$213.4 billion.

Translating these fair-value adjustments into restatements of Ottawa's annual budget balances highlights the fact that the federal government's

accounting misstates the cost of its operations. Briefly, Ottawa's spending has been higher than reported, since the total cost of compensating its employees is higher than shown in the Public Accounts. More subtly, the composition of its expenditures has been different than reported. Fair-value accounting would have shown somewhat lower interest charges. More than offsetting those lower interest charges would have been much higher compensation of employees – both higher current compensation (Hamilton 2014b), and increases in the value of pension benefits earned in the past.

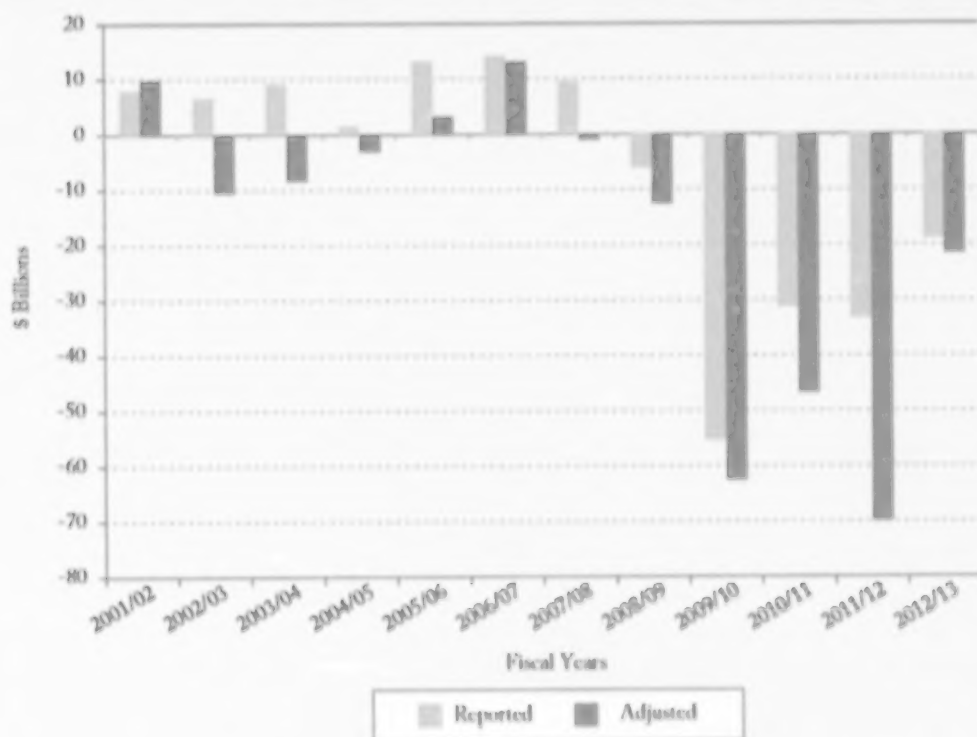
Table 2: Fair-Value Adjustments to the Federal Pension Balance Sheet, Fiscal Years 2000/01–2012/13

	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13
(\$ billions except where otherwise indicated)													
Assets as reported	2.8	5.9	8.9	13.4	18.3	24.9	31.6	38.7	37.2	44.9	53.5	62.0	71.7
Assets at fair value	2.5	5.6	8.1	14.2	19.4	27.6	35.0	38.9	33.8	46.3	58.0	64.5	76.1
Obligation as reported	124.0	125.9	134.3	142.4	145.3	155.8	168.3	178.6	190.3	201.4	213.3	220.8	242.7
Effective discount rate used in Public Accounts (percent)	3.52	3.54	3.47	3.49	3.52	3.31	3.34	3.37	3.15	3.19	3.23	3.12	unfunded: 2.6 funded: 3.9
Real return bond yield (percent)	3.51	3.68	3.05	2.39	2.03	1.58	1.76	1.60	1.81	1.56	1.15	0.51	0.49
Sensitivity of liabilities to 1% lower discount rate	18.6	18.6	17.5	22.6	22.7	24.9	27.0	28.1	31.1	32.6	34.6	38.4	unfunded: 20.7 funded: 18.1
Obligation at fair value	124.3	123.2	141.7	167.3	179.1	198.8	210.9	228.3	232.1	254.5	285.2	331.1	348.2
Unrecognized actuarial gain/loss	8.3	7.3	0.7	-0.9	3.1	0.7	-1.3	-1.7	-12.6	-13.2	-13.2	-19.4	-18.9

Note: For the first time in 2013, the Public Accounts show a separation between "funded" and "unfunded" benefit obligation sensitivities to discount rate changes; see Box 1 for further methodological details.

Sources: Canada, Receiver General for Canada, Canada, Office of the Chief Actuary; Bank of Canada; and authors' calculations.

Figure 2: Federal Budgetary Balance, Reported vs Adjusted with Fair-Value Pension Accounting, Fiscal Years 2001/02–2012/13



Sources: Canada, Receiver General for Canada (various years); authors' calculations as described in text and explained in Laurin and Robson (2009).

The reported costs of federal employees are wages and salaries plus the recorded increase in post-retirement benefits, less relevant employee contributions.¹⁰ Reported interest costs include notional interest on the recorded pension

obligation.¹¹ The fair-value approach uses a market interest rate, which, as it is considerably lower than the notional interest rates Ottawa uses to calculate its interest costs, yields lower debt charges even though it applies to a higher pension obligation.¹²

10 In the case of pensions, the recorded increase consists of pension benefits earned (net of employee contributions) plus various adjustments related to plan amendments, curtailments or settlements and amortization of actuarial losses or gains – this last category having no place in a fair-value approach.

11 That is, notional interest expenses on the benefit obligation net of investment income on pension investments.

12 Fair-value interest expenses are obtained by multiplying the fair-value pension obligation shown in Table 1 by the RRB rate, net of the actual income on pension investments (reported investment income figures are smoothed over time).

This lower interest cost, however, is more than offset by the larger pension costs revealed by the fair-value approach (Figure 3). Part of this larger pension cost is larger-than-reported annual accruals. As we detail in the next section, the rate at which federal employees earn benefits is a much higher share of their pensionable earnings than Ottawa reports when it calculates the value of the benefits with a high discount rate. The rest is changes in the value of benefits earned in the past. These have been increasing as lower bond yields have boosted their value to pensioners and the corresponding obligation of taxpayers – who, as we noted at the outset, underwrite the risks inherent in guaranteeing a pension benefit regardless of economic circumstances.

The fair-value approach to pensions thus reveals that some familiar measures of Ottawa's fiscal situation, such as program expenditures and the primary balance – the difference between non-investment income and non-interest expenses – are misleading. Program expenditures have been higher, and the primary balance worse, than the Public Accounts have shown. Some of this deterioration reflects the ongoing accrual of new pension benefits, which has been higher than shown. The rest reflects the risks underwritten by taxpayers related to the guarantee of past benefits – which, in principle, can swing either in their favour or against it, but which, over the period from fiscal 2000 to 2013, swung decisively against it.

REDUCING AND CONTAINING TAXPAYER EXPOSURE TO FEDERAL EMPLOYEE PENSIONS

The fair-value approach to calculating Ottawa's pension obligations shows that taxpayers are underwriting more costs related to federal employment than conventional measures suggest. This is partly because the pension promises being made each year are more costly than reported, and partly because the cost of the guarantee of past pension promises has been rising.

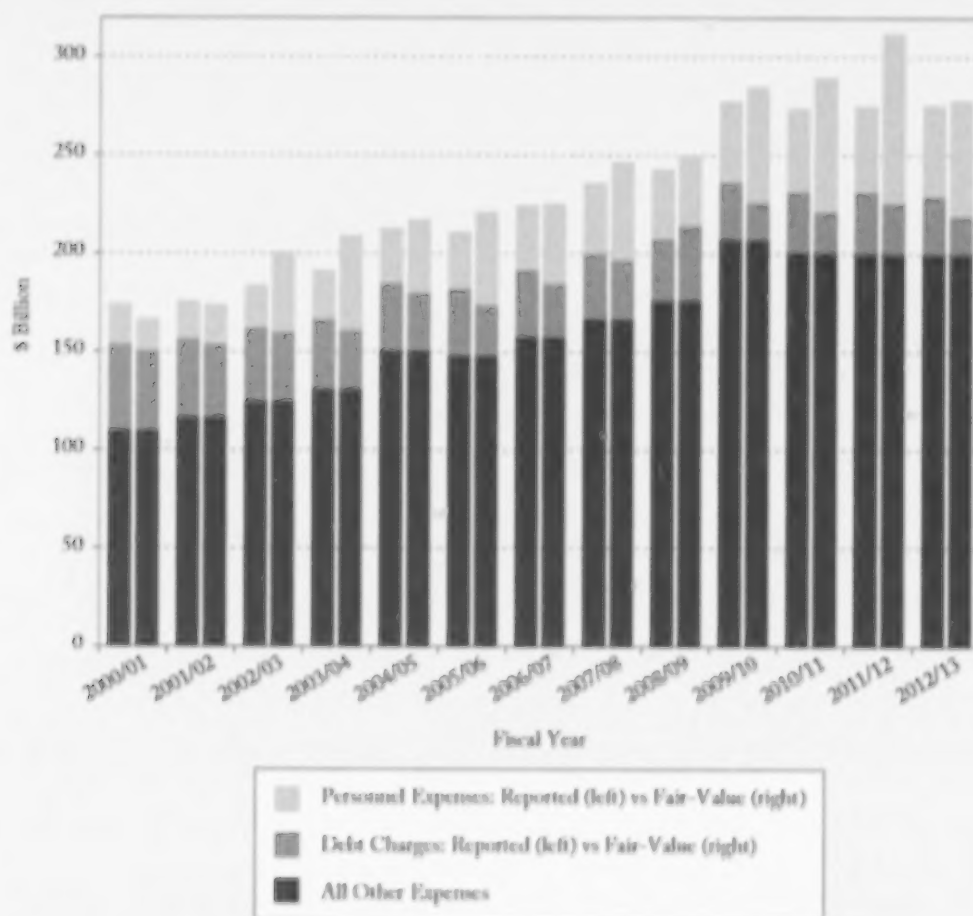
DB pension plan advocates often tout the insulation of plan participants from risk as a virtue. But the growth of the reported, and even more the unreported, federal pension liability shows that insulating participants from risk does not make risk disappear; it merely shifts the burden of the risk to other people. In 2012, the federal government responded to growing concern about its employees' pensions with some reforms. Those reforms, however, were modest in comparison to the scale of the problem, and in one key respect show how important a clear statement of the pension liability is to resolving it.

The Misleading Label on Ottawa's "Funded" Plans

As we have noted, no funds were set aside to cover the cost of federal employees' pensions prior to 2000. Since April 1 of that year, contributions made by employees and the federal government as their employer – the formal contributions, not the implicit underwriting by taxpayers just discussed – have been invested in financial assets. Ottawa reports the status of the previous unfunded plans and the newer funded plans separately.

The 2013 Public Accounts showed that \$76.6 billion (see Table 1) of assets had accumulated in the plans since April 2000. Against this amount, the Public Accounts showed \$83.7 billion of future pension benefits earned since April 2000. So the official figures showed a funding ratio of 91 percent – not as good as full funding or a surplus, but not an alarming figure. If one restates the obligations earned since 2000 at fair value, however, the pension obligations incurred since then are almost three-quarters higher than in the official figures: \$145.4 billion (Table 3). Contributions to the Public Service, Canadian Forces and RCMP plans, plus the returns on the plans' assets, have been well short of their growing obligations. At fair value, even the "funded" plans contain barely enough assets to cover half their obligations.

Figure 3: Fair-Value Restatement of Annual Federal Expenditures: Personnel Expenses, Debt Charges and All Other Expenses, Fiscal Years 2000/01–2012/13



Sources: Canada, Receiver General for Canada (various years); authors' calculations as described in the text.

Reflecting the Fair-Value Pension Promise in Federal Employees' Contributions

The fact that contributions have been insufficient to cover benefit accruals since 2000 is relevant to an assessment of recent changes to federal pensions. The 2012 *Jobs and Growth Act* affected some benefits – notably increasing the normal retirement age and other age thresholds from age 60 to 65 for new members joining the Public Service plan on

or after January 1, 2013 – but its most far-reaching changes were on the contribution side.

Notably, the *Act* initiated increases in the employees' share of contributions to the Public Service plan, such that their share will reach half the reported cost of the plan by the end of 2017. It also initiated increases in employees' contributions to the Canadian Forces and RCMP plans. Their contributions will follow the (lower) path of

Table 3: Pension Assets and Liabilities Accrued since the April 2000 Reform, as of March 31, 2013

	Reported	Fair Value
Pension obligation (\$ billions)	83.7	145.4
Market value of pension assets (\$ billions)	76.6	76.6
Funding ratio (percent)	91	53

Sources: Canada, Receiver General for Canada (2012/13); authors' calculations as described in the text and Box 1.

increases for Public Service plan members who joined prior to the increase in that plan's normal retirement age, reaching about 45 percent of the reported costs of the Canadian Forces and RCMP plans by 2018.

Higher employee contributions will reduce the annual cost of these plans to taxpayers from what it would have been otherwise, but they will leave the total cost to taxpayers much higher than the 50:50 cost-sharing figure suggests. This is because the 50:50 split is calculated on the basis of a cost estimate shrunk by aggressive discounting of future pension payments.

A major component of the annual increase in retirement wealth enjoyed by a typical participant in a pension plan is the plan's "current service cost" – the value of deferred compensation for employment expressed as a percentage of the participant's pensionable pay. The current service costs for each of the major federal plans, as calculated in the most recent reports of Canada's Chief Actuary,¹³ appear in the first column of Table 4.

Deducting the employee contributions, shown in the second column, yields the reported government contribution, shown in the third column. Over time, the reforms will make the reported employee and government contributions more equal.

But these reported current service costs are too low. Because the Chief Actuary's valuations provide sensitivities of service costs to different assumptions about rates of return, we can – with logic similar to that underlying our calculations of fair value for the pension balance sheet – estimate what the current service cost of these plans would be using the RRB yield as a discount rate. The resulting figures – the actual retirement wealth accruing to the average participant in each plan as a percentage of pensionable pay – appear in the fourth column of Table 4.¹⁴ Deducting employee contributions from these amounts yields the government contributions shown in the final column of Table 4. These much larger amounts are taxpayers' annual exposure as measured by the fair-value approach.

13 As at March 31, 2011, for the Public Service plan (Canada 2012), with an update as at January 1, 2013, to reflect the pension changes from the *Jobs and Growth Act* (Canada 2013a); as at March 31, 2010, for the Canadian Forces plan (Canada 2011); and as at March 31, 2012, for the RCMP plan (Canada 2013b).

14 Because the RRB yield at the end of March 2013 was well below the range presented in the Chief Actuary's sensitivity analysis, different methods for extrapolating current service costs can produce quite different results. Among the various straightforward methods for extrapolating are log-linear, exponential, and polynomial. The exponential and polynomial methods produce similar numbers, both lower than the log-linear approach. Table 3 shows the results of polynomial estimates.

Table 4: Current Service Cost of Federal Pension Plans, 2013

Federal Pension Plan	Reported			Fair Value		
	Current Service Cost	Employee Contributions	Taxpayer Contributions	Current Service Cost	Employee Contributions	Taxpayer Contributions
	<i>(percent of pensionable pay)</i>					
Public Service	20.1	7.6	12.5	47.3	7.6	39.7
Royal Canadian Mounted Police	22.7	7.4	15.3	55.8	7.4	48.4
Canadian Forces	23.1	6.7	16.4	60.3	6.7	53.6

Note: Contributions and current service costs are for 2013 before the changes for existing employees (Group 1 employees).

Sources: Authors' calculations based on Canada (2011, 2012, 2013a,b), and as explained in the text.

A glance at the reported and fair-value contributions reveals that, even after the increases in employee contributions anticipated by the 2012 reforms, the true contribution of taxpayers to the pension plans – measured by the RRB yields that prevailed at the end of March 2013 – would be far more than 50 percent. Although 50:50 cost sharing sounds fair, collecting 50 percent of an understated total from employees will still leave taxpayers carrying far more than half the load. Only if the current service cost is calculated on a fair-value basis will the cost of annual pension accruals be shared equally between participants and taxpayers.¹⁵

More Equitable Sharing of Risks Related to Past Service

Unfortunately for taxpayers, even genuine 50:50 cost sharing of current service costs based on a fair-value estimate of those costs would address only a small part of their exposure to the cost of federal pensions. They would still see their contributions change year-to-year as changes in interest rates, experience and plan provisions affected current service costs. Far more important, they would still be exposed to changes in the cost of servicing previously earned benefits – which, as the growth in the unreported liability since the early 2000s shows,

¹⁵ The fact that the federal *Income Tax Act* prohibits annual contributions to defined-contribution pension plans and registered retirement savings plans greater than 18 percent of pay up to a maximum in the low \$20,000 range prompts us to point out how generous the tax-deferral opportunities for federal employees are relative to those for other Canadians (see Pierlot and Siddiqi 2011 for more on this). Individuals not employed by the federal government who seek to build a similar retirement nest-egg would need to save even more of their pre-tax earnings than these startling current service cost estimates imply, because they would need to do most of that saving with post-tax income – and it is doubly unfair considering they are also on the hook for the unfunded liability of federal employees' pension plans.

has increased their liabilities enormously in recent years.

This increase in the burden on taxpayers is a direct reflection of the fact that the federal pension plans are pure DB plans, intended to protect all earned benefits from any hazard short of the insolvency of the plan sponsor. The record of the federal plans shows why this feature is not as positive as many advocates of DB plans maintain. Hardly any of the taxpayers who shoulder this burden know about it, the plans' designers did not consult them adequately – indeed, the taxpayers might not have been born at the time – and taxpayers have very few tools with which to affect or manage the risks forced on them.

More durable pension arrangements exist. One type is money-purchase arrangements – typically, DC plans in which the payments in retirement are a straightforward function of how much money is in the plan. Another is plans in which the formulas determining benefits reference the plan's funded status – by, for example, reducing or suspending inflation indexation when the plan is in deficit. Such flexible-benefit arrangements are typically jointly governed, with plan participants having a voice in the plan's management and an incentive to see it run in a sustainable manner.

We discuss possible conversion of the federal plans in the next section. Here we merely observe that a straightforward way to reduce taxpayers' exposure to future changes in the value of earned benefits of the federal plans would be to cap

employer contributions at a fixed share of current service costs.¹⁶ Then, plan participants would be responsible for paying not just the balance of each year's current service cost, but also whatever it takes to cover changes in the cost of previously earned benefits.¹⁷

RECOMMENDATIONS FOR MORE SUSTAINABLE AND FAIRER FEDERAL PENSIONS

Notwithstanding the 2012 changes to federal pensions, the size of Ottawa's unfunded pension liability and the continuing exposure of taxpayers to risks they do not understand and cannot effectively control mean the process of reform has only begun.

Report Fair-Value Estimates at Matching Market Yields

The first step is to accelerate the move toward more economically meaningful presentations of the numbers. The artificially low annual and accumulated costs for federal pensions in the Public Accounts mean that the most familiar – and in most people's eyes, definitive – presentations of Ottawa's financial position understate the actual cost of federal government employment, understate the net federal debt and distort the annual bottom line.¹⁸

Some readers will object that public-sector accounting standards do not mandate fair-value estimates of pension plan costs and obligations.

16 Gros (2013) recommends that provincial governments, too, set the amount they are willing to contribute to their employee pension plans, pointing to New Brunswick as a province that has specified 18 percent of covered pay as the maximum combined contribution rate for its public-sector plans going forward.

17 In many flexible-benefit or shared-risk plans, such as the Ontario Teachers' Pension Plan, participants share the cost of funding past benefits, and therefore the risk that these might turn out to be more expensive than expected. The federal arrangement, which insulates plan participants from this large risk and instead imposes it entirely on taxpayers, increasingly stands out as anomalous.

18 They also obscure the degree to which the people who make and enforce the rules that constrain other Canadians' retirement saving benefit from far more generous provisions for their own retirement.

In our view, they should. Private-sector standards for DB pension plan funding are more demanding than they once were because experience taught regulators that discounting future payments with aggressively high interest rates fostered insolvent plans and defaults on pension promises.¹⁹ Detroit's bankruptcy, in which the state of Michigan's decision to file in federal court, where the city's pension obligations would not rank ahead of other municipal debts, is a recent stark reminder that the same can happen in public-sector plans.

In any event, Ottawa need not wait for changes to public-sector accounting standards to report fair-value numbers for its pensions. It could do so with additional information in the Public Accounts. Or it could simply report fair-value numbers in its principal financial statements. Doing so would ensure that legislators, taxpayers and plan participants themselves have a clearer picture of the problem that needs to be addressed.

Adjust Contributions to Match Fair Value

The second step would be to raise employee contributions to 50 percent of the value of accruing benefits, calculated not with high discount rates unrelated to actual market yields, but with reference to actual returns on securities that match the obligations.

Change the Plans' Benefit Structure

The third step would be to make further changes to the plans' benefit structure. Raising the normal retirement age would help, but it would be a crude and inflexible way of responding to the

many factors that can affect the practicality of a given pension promise. An alternative would be to eliminate early retirement, or at least the incentives that encourage it.

A further desirable reform would be to switch benefits from a final-salary to a career-average formula. Gearing benefits to a person's purchasing power at the end of her or his career rather than to its average over the career creates opportunities for "spiking," and redistributes wealth inside pension plans away from those with relatively flat career earnings profiles, such as administrative staff, and toward those with steep earnings profiles, such as senior government executives (Young 2012). Plan participants with relatively flat career earnings might tolerate that redistribution when understated costs are keeping contributions low, but likely would resist it if fair-value costs made contributions higher than their own relatively modest pensions are worth.

More fundamentally, however, the federal government should abandon the pure DB model – a model that has all but disappeared in the private sector and is increasingly rare in the public sector, where shared-risk, target-benefit plans are now more prevalent.²⁰ The broader public-sector plans that many provinces established in the 1990s contain provisions – which some would call flexible or "managed" DB – that make future benefit accruals contingent on plan funding. New Brunswick's new "shared-risk" pension regime also makes benefits already earned contingent on plan funding – a far more powerful tool in mature plans.

A shift to flexibility in benefits, especially benefits already earned, will be a tough sell to a workforce currently enjoying a uniquely privileged

19 For solvency valuations, Canadian plans must use discount rates that are about 50 basis points above the yield on Government of Canada long bonds; for going-concern valuations, Canadian plans must use discount rates equal to the yield on high-quality corporate bonds.

20 Many broader public-sector plans in most provinces now contain provisions that make future benefit accruals contingent on plan funding. New Brunswick's new pension regime also makes benefits already earned contingent on plan funding.

position, but there is an obvious alternative: a DC plan. The representatives of federal employees would react strongly against such a plan. Most Canadians, however, must save in money-purchase arrangements, and many would think it simply fair if federal employees were obliged to do likewise. Indeed, some Canadians might think it likely that having federal employees in the same situation would hasten the day when some of the policies that disadvantage money-purchase arrangements – such as obstacles to annuitization in DC plans,²¹ adverse tax treatment compared to DB plans and limits on tax-deferred saving – might disappear. DC plans have disadvantages, especially when it comes to pooling longevity risk, but the disagreeable prospect of being obliged to participate in an arrangement more like that of most Canadians should help bring federal employees around to the target-benefit model.

CONCLUSION

An economically meaningful fair-value estimate of the unfunded liability of federal government employees' pension plans puts it at \$272 billion – some \$120 billion higher than reported. The same approach to determining the annual cost of benefits accruing in these plans shows it to be between 45 and 60 percent of pensionable pay – more than twice as high as reported, and a far higher rate of tax-deferred wealth accumulation than is available to other Canadians. The federal government should incorporate these numbers in the official measures of its net debt and annual budget balance. This would be a key first step toward reforms that would alleviate a burden that few taxpayers know they bear, and that would protect taxpayers from risks few know they run.

21 Federal tax rules generally prohibit any pension plan from paying a pension annuity unless it is a DB plan, subject to grandfathered exceptions (Pierlot and Laurin 2012). The Ontario government recently announced its intention to develop regulations that would allow DC plans to pay retirement income directly to retirees (Ontario 2013).

APPENDIX

Table A-1. Estimates of the Sensitivity of Pension Obligations to an Increase in the Discount Rate

	Funded	Unfunded	Total
	(\$ billions)		
Fiscal year 2011/12 sensitivity to an increase of 1 percent in the discount rate of "funded" obligations and to an increase of less than 1 percent (undisclosed value) for "unfunded" obligations (from Canada, Receiver General for Canada 2012/13, 2.25)	16.2	10.6	26.8
Fiscal year 2011/12 sensitivity to an increase of 1 percent in the discount rates of "funded" and "unfunded" obligations (from Canada, Receiver General for Canada 2011/12)			38.4
Fiscal year 2011/12 sensitivity breakdown for full 1 percent increase in the discount rate	16.2	22.2	38.4
Fiscal year 2012/13 sensitivity to an increase of 1 percent in the discount rate of "funded" obligations and to an increase of less than 1 percent (undisclosed value) for "unfunded" obligations (from Canada, Receiver General for Canada 2012/13, 2.25)	18.1	9.9	28.0
Estimated fiscal year 2012/13 sensitivity to an increase of 1 percent in the discount rate, deducted using the ratio of 2011/12 unfunded sensitivities as a guide	18.1	20.7	38.8

Sources: Canada, Receiver General for Canada (2011/12, 2012/13).

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